Fab Speakers
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Soldering a component

1. Hold the iron against the pad for a second or two, apply solder, and wait a second or two before removing iron.

2. It should look something like this.

3. Carefully position chip with tweezers (stripe facing up), hold iron against chip’s leg for a few second until solder melts, remove iron, and release chip.

4. The solder should hold the chip in place.

5. Solder the other legs of the chip: hold the iron against the leg for a second or two, apply solder, and wait a second or two before removing iron.

6. It should look like this. The solder shouldn’t bridge between two legs of the chip (except for the ones that are connected on the diagram).
Soldering the rest of the small components

TPA701 amplifier chips (line facing up)

2.2 uF capacitor (marked w/ black dot)

10K resistor (marked 103)

49.9K resistor (marked 4992)

0.47 uF capacitors

1 uF capacitor (marked w/ red dot)

10K resistor
Soldering the bigger components

1. From the bottom, insert the switch in the three equally-sized holes and solder it in place.

2. Also from the bottom, insert the battery holder in the holes and solder in place.

3. From the top, insert the three wires of the audio cable, with the fatter wire in the middle hole. Solder in place.

4. Solder two pieces of the double-wire cable in place: one short (for the speaker containing the circuit board), one long (for the other speaker).

5. Solder the cables to the speakers.

6. It should look like this and is now ready for testing. Insert batteries, switch on (towards the center of the speaker), and connect to an audio source.
Assembling the frame

1. The laser-cut plywood pieces. Note that the top three struts are different from the bottom three (the tapered ends are asymmetric).

2. Place the circuit board into the bottom face, with the battery holder and power switch extending through the rectangular holes.

3. These struts will hold the circuit board in place. Be sure you’re using the ones with asymmetric bottoms (indicated with the arrows).

4. Press the struts into the bottom face, being sure that the side with the larger gap at the bottom faces inward (to hold the circuit board).

5. Rest the speaker on the struts and press the top face into place. (The top for both speakers is the same.) You might need to tap it with a mallet.

6. The speaker should be held firmly against the top. Only the widest (top) ridge of the speaker should be resting on the struts.
Gluing the fabric and ironing on the veneer.

1. Cut out a piece of fabric a bit bigger than the top of the speaker. (One or two centimeters of fabric – half an inch – should extend beyond the wood on all sides.)

2. Coat the edge of the top face with wood glue. You want a fairly thick line of glue all the way around.

3. Pull the fabric over the top, pushing it against the sides to get the glue in it. Hold it in place with masking tape while the glue dries.

4. When the glue is dry, glue another strip of fabric around the bottom piece of wood. Wait for the glue on this piece to dry.

5. When the glue is dry, wrap the veneer around and iron in place. Line it up carefully and hold it tightly in place as you iron it.
Assembling the other speaker

1. Slip the cable of the remaining speaker through the slot in the edge of the bottom piece of wood.

2. Insert the struts, ensuring that the lower shelf (at the top) is towards the center (as shown by the arrows).

3. Place the speaker on the struts.

4. Press the top piece in place. Again, you may want to use a mallet.

5. Glue the fabric and iron on the veneer as with the first speaker. Here’s the finished pair.
Soldering the wall-mounted variation

1. Snip the end off of the power supply.
2. Strip the ends of the two wires and twist the individual strands together.
3. Solder the power supply in place of the battery holder. Make sure the wire with the white dashed line goes in the location indicated.
4. In place of the power switch, solder together the right two of its three holes.
5. Solder the audio cable and speakers to the board, using short wires for both speakers.
Assembling the wall-mounted variation

1. The laser-cut plywood pieces for the wall-mounted variation. Note that the four struts at the top are different than the two at the bottom: they have uneven sides at both ends.

2. Place the circuit board in the middle of the bottom face and insert the struts to hold it in place. Be sure the shorter sides of the struts face inward.

3. Rest the speakers on the struts. Make sure only the outer rim of the speakers is on them.

4. Press the top in place. You might need to use a mallet.

5. The speakers should be pressed tight against the top face.

6. Glue the fabric and iron on the veneer as with the regular speakers. You’ll need to cut a notch for the cables to go through.